Information Disclosure Statement

Applicant respectfully requests that a copy of the 1449 Form, listing all references that were submitted with the Information Disclosure Statement filed on January 17, 2002, marked as being considered and initialed by the Examiner, be returned with the next official communication.

§112 Rejection of the Claims

Claim 1 was rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Claim 1 is amended for clarity. Applicant believes that claim 1, as amended, particularly points out and distinctly claims the subject matter which Applicant regards as the invention. Therefore, Applicant requests that claim 1 be reconsidered and that the rejection of claim 1 be withdrawn.

§103 Rejection of the Claims

Claims 1, 3-12, 64, 65, 68, and 71 were rejected under 35 USC § 103(a) as being unpatentable over Cook et al. (U.S.5,457,345) in view of Thomas (U.S. 4,661,375) and Strube et al. (U.S. 4,650,548).

Applicant respectfully reintroduces the analyses of the Cook et al., Thomas, and Strube et al. patents to further emphasize the differences between these patents and the claims of the present patent application.

Analysis of the Cook et al. Patent

In the Cook et al. patent, the described prior art used a removable metal (molybdenum) mask to prevent solder from being applied to anywhere but the pads. However, the molybdenum mask limited the size of solder pads to be 100 microns or more (see column 2, lines 10-16). To make smaller pads, a photoresist lift-off mask is used to define a removable mask (column 2, lines 21-25). To remove the mask, process chemicals such as perchlorethylene or other chlorine

chemicals are used to strip the photoresist mask after the solder is applied to the pad. Cook et al. determined that the existing metallurgy of the pad was damaged by the exposure to chlorine (see column 2, lines 55-57). So Cook et al. constructed a new metallurgy for the pad to resist the chlorine damage (column 2, lines 50-55). Cook et al. did not use selective deposition of solder and did use a removable mask.

Analysis of the Thomas Patent

In the Thomas patent, an implication is made that one could form a C4 joint without the use of a mask. Thomas states "Besides eliminating the photomasking operations involved in vacuum evaporation and electroplating, a solder reflow step is not required to spheridize the bumps 10-10." (See column 3, lines 63-66). Thomas does not explicitly state that the initial solder ball is formed without a mask. Thomas merely states that one starts with a solder ball and builds it up in height by successive immersions in solder baths having differing ratios of Pb and Sn.

Analysis of the Strube et al. Patent

The Strube et al. patent describes electrolytic build-up of solder on a printed circuit board. A "galvano resist" pattern is used as a mask which is then stripped off after deposition. (See Figure 1 and see step 8 in column 2, line 26 and step 8 in column 2, line 62.) This is not a selective deposition.

Analysis of the Combination of the Patents

The Cook et al. patent describes depositing the solder by evaporation and with a mask. The Examiner relies of the statement in Cook et al. that the solder contact could be formed by "other suitable means." This type of generalized statement is often included in patent applications in an attempt to broaden the possible equivalents for elements in the claims. In this use, the phrase "other suitable means" has no other support or description in the Cook et al. patent. Hence, there is no teaching as to what would or would not be a suitable means. There must be some reasonable limit to the equivalent means but we are left to guess what that is.

The Thomas patent is combined with the Cook et al. patent to provide immersion as an "other suitable means" for depositing solder. However, Cook et al. uses removable masks and evaporation for the deposition. Thomas et al. uses immersion for the deposition. The claims of the present patent application recite that no removable mask is used and we do not claim immersion as a deposition means.

The Strube et al. patent is combined with the Cook et al patent to provide electrolytic deposition as an "other suitable means" for depositing solder. However, both Cook et al. and Strube et al. use removable masks. The claims of the present patent application recite that no removable mask is used.

Examiner's response regarding the Cook et al. patent

In the office action dated February 13, 2002, on page 5, the Examiner states that the metallization composite (element 44, Figure 4) is the only place that the solder is deposited on and it (the metallization composite) is not removed after the deposition. Applicant respectfully points out that the metallization composite, shown in Figure 4 and also in Figures 1 and 3, is not the removable mask used in an evaporation process to deposit solder on the metallization composite. In Figures 1, 3, and 4, the solder is deposited on the metallization composite by an evaporation process (see column 6, line 28). In the evaporation process, a removable mask (not the metallization composite) is removed after the solder has been deposited on the metallization composite (see the Cook at al., column 1, lines 36-41). Thus, the metallization composite of Cook et al. patent not being removed, as stated by the Examiner, is not the same as the insulating of claim 1 not being removed.

Examiner's response regarding the Strube et al. Patent

In the same office action dated February 13, 2002, on page 5, in response to Applicant explaining that Strube uses a removable mask in a solder deposition, the Examiner states that "it is used only to demonstrate that is well known to form a solder by electrolytic deposition". Applicant respectfully points out again that claim 1 differs from the well known method demonstrated by Strube because in claim 1, no removable mask is used.

In light of the analyses above, Applicant believes that the claims of the present patent application are different from the combination of the Cook et al., Thomas, and Strube et al. patents. For example, independent claim 1 recites a limitation of "depositing solder on the exposed portion of the metal contact pad, wherein depositing solder on the exposed portion of the metal contact pad uses a deposition process selected from a group consisting of selective chemical vapor deposition and selective electrolytic deposition, thereby forming a solder contact by selectively depositing solder only on the exposed portion of the metal contact without depositing solder on the insulating layer and without removing a remaining portion of the insulating layer". The combination of the Cook et al., Thomas, and Strube et al. patents does not teach or suggest this limitation. Therefore, Applicant believes that claim 1 is patentable over Cook et al. in view of Thomas and Strube et al. Accordingly, Applicant requests reconsideration of claim 1 and that claim 1 and the claims that depend on claim 1 be allowed.

Claims 9, 11, 12, and 71 recite similar limitations as that of claim 1. Therefore, Applicant believes that claims 9, 11, 12, and 71 are also patentable over Cook et al. in view of Thomas and Strube et al. Accordingly, Applicant requests reconsideration of claims 9, 11, 12, and 71 and that these claims and the claims that depend on these claims be allowed.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's representative (612- 373-6969) to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

PAUL A. FARRAR

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Date 5-13-02 By _____
Viet Tong
Reg. No. 45,416

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner of Patents, Washington, D.C. 20231, on this 13th day of May, 2002.

Name Amy Moriarty _____ Signature _____